NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

CROSS WIND TRAP STRIPS

(Ac.)

CODE 589C

DEFINITION

Herbaceous cover resistant to wind erosion established in one or more strips across the prevailing wind erosion direction.

PURPOSE

- Reduce soil erosion from wind.
- Induce deposition and reduce transport of wind-borne sediment and sediment-borne contaminants downwind.
- Protect growing crops from damage by wind-borne soil particles.
- Provide food and cover for wildlife.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to cropland or other land susceptible to wind erosion.

CRITERIA

General Criteria Applicable to All Purposes

Number of Strips. A crosswind trap strip system shall consist of one or more strips across the prevailing wind erosion direction. This practice may also serve as a component of a conservation system that includes conservation practice standards 603, Herbaceous Wind Barriers; or 380, Windbreak/Shelterbelt Establishment.

Width of Trap Strips. Trap strips shall be wide enough to trap saltating soil particles and store wind-borne sediments originating upwind.

The width of the trap strip shall be at least 15 feet when the vegetation in the strip is one foot or more in height during periods when wind erosion is expected to occur.

The width of the trap strip shall be at least 25 feet when the effective height of the vegetation in the strip will normally be less than one foot during periods when wind erosion is expected to occur.

Vegetative Cover. Trap strips will consist of perennial plants. Vegetation may consist of warm season or cool season grasses, legumes or grass-legume mixtures that meet the following criteria. Plant materials shall be selected for the following characteristics:

- Adaptation to the site.
- Erect during wind erosion periods.
- Tolerant to sediment deposition.
- Ability to withstand snow drifting.
- Compatibility to secondary purposes (i.e. provide wildlife food and cover).

Perennial vegetation will be established according to the Oklahoma NRCS Pasture and Hay Planting (512) or Range Planting (550) standards and specifications. Planting rates, dates, varieties, area of adaptation and seedbed requirements for grasses will be in accordance with the above standards and specifications.

Management of Vegetative Cover in Strips. Haying or mowing of trap strips shall be done only during periods when wind erosion or crop damage will not occur. The design height shall be maintained during the erosive wind periods. Height requirements for haying or mowing shall be in accordance with Table 1 in the Oklahoma NRCS Forage Harvest Management (511) standard and specification.

Grazing shall only be done in periods when wind erosion or crop damage will not occur. Grazing shall be in accordance with the Oklahoma NRCS Prescribed Grazing (528)

standard and specification. Grazing heights shall be maintained one inch higher than the heights listed in the continuous use column (Table 1) of the 528 standard and specification.

Grasses established in the trap strips shall be allowed to grow to their planned height before periods of wind erosion and/or crop damage.

Trap strips will be fertilized as needed to maintain plant vigor. Applications of fertilizer will follow the guidance of the Oklahoma NRCS Nutrient Management (590) standard and specification. Pest management needs will be performed in accordance with the Oklahoma NRCS Pest Management (595) standard and specification.

Additional Criteria to Reduce Soil Erosion from Wind

Location of Trap Strips. Trap strips established for this purpose shall be located as follows:

- At the windward edge of fields; or
- Immediately upwind from areas to be protected from erosion or deposition; or
- In recurring patterns interspersed between erosion-susceptible strips.

Direction and Width of Erosion-Susceptible Strips. The effective width of strips shall be measured along the prevailing wind direction during those periods when wind erosion is expected to occur. Prevailing wind direction in Oklahoma is north and south. It shall not exceed the width determined to keep potential soil erosion below the established soil loss tolerance (T).

When the direction of trap strips deviates from being perpendicular to the prevailing wind erosion direction, the width of the erosion-susceptible strips shall be correspondingly reduced so that soil loss tolerance (T) is not exceeded.

Strip orientation shall not result in an angle of deviation that exceeds 45 degrees during the management period(s) when wind erosion is expected to occur. The angle of deviation is the angle between an imaginary line perpendicular to the long dimension of the strip and the prevailing wind erosion direction.

The width of strips shall be determined using current approved wind erosion prediction technology. Calculations shall account for the effects of other practices in the conservation management system.

Additional Criteria to Induce Deposition and Reduce Transport of Wind-borne Sediment and Sediment-borne Contaminants Downwind

Location of Trap Strips. Trap strips shall be established immediately upwind from areas to be protected from sediment deposition. There shall be no erosion-exposed area located between the trap strip and the area to be protected from sediment deposition.

Additional Criteria to Protect Growing Crops from Damage by Wind-borne Soil Particles

Placement of Trap Strips. Trap strips shall be established immediately upwind from areas used for sensitive crops. There shall be no erosion-exposed area located between the trap strip and the crop to be protected.

Direction and Width of Strips of Sensitive Crops. The effective width shall be measured along the prevailing wind erosion direction during those periods when sensitive crops are susceptible to damage by wind-borne soil particles. The effective width shall not exceed the width permitted by the crop tolerance to wind erosion*. **Refer to Table 1, Estimated Crop Tolerances to Blowing Soil.**

*Crop tolerance to wind erosion is the maximum rate of soil blowing that crop plants can tolerate without significant damage due to abrasion, burial or desiccation.

When the direction of trap strips deviates from being perpendicular to the prevailing wind erosion direction, the width of strips planted to sensitive crops shall be correspondingly reduced so that estimated soil loss does not exceed crop tolerance.

The width of the crop strips shall be determined using current approved wind erosion prediction technology to estimate wind erosion during specific crop stage periods. Calculations shall account for the effects of

other practices in the conservation management system.

Additional Criteria to Provide Food and Cover for Wildlife

Trap strips used for this purpose must meet the design criteria for any of the above intended purposes.

Vegetative Cover. Trap strips shall consist of vegetation that provides food and/or cover for the targeted wildlife species. Refer to the Oklahoma NRCS Upland Wildlife Habitat Management (645) standard and specification for guidance on habitat development.

Trap strips used to enhance wildlife habitat shall be planted to a native grass mixture. Forbs and/or legumes may be added to native grass plantings. The Oklahoma Biology Technical Notes provide a list of forbs and legumes best suited for wildlife in Oklahoma.

Width of Cross Wind Trap Strips. The trap strip used for this purpose will be at least 30 feet wide.

Trap Strip Height. Trap strips designed for this purpose shall be *1.5 to 3.0 feet tall* and provide adequate cover for wildlife species.

CONSIDERATIONS

The effectiveness of Cross Wind Trap Strips is maximized when strips are oriented as close to perpendicular as possible to the prevailing wind erosion direction for the period for which the system is designed.

Selection of plants for use in trap strips should favor species or varieties tolerant to herbicides used on adjacent crops or other land uses. When trap strips are designed to enhance wildlife habitat, plant species diversity within the strip should be encouraged. Trap strips that result in multiple structural levels of vegetation within the strip will maximize wildlife use.

Some plants are damaged by blowing wind as well as by wind-borne sediment. In such cases, the spacing between trap strips may have to be reduced from that obtained using wind erosion prediction technology.

Drifting snow or grazing by wildlife may reduce the trapping capability of trap strips. In such cases, other conservation practices, including the residue management practices (329A, 329B, or 329C); conservation practice standards 603, Herbaceous Wind Barriers; or 380, Windbreak/Shelterbelt Establishment, may be used with, or as alternatives to, trap strips to achieve the conservation objective.

PLANS AND SPECIFICATIONS

Specifications for establishment and maintenance of this practice shall be prepared for each field or treatment unit according to the Criteria, Considerations, and Operation and Maintenance described in this standard.

Specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation.

OPERATION AND MAINTENANCE

After establishment, perennial trap strips shall be fertilized as needed to maintain plant vigor. Noxious weeds shall be controlled with mowing or chemicals.

Mowing or grazing of trap strips shall be managed to allow re-growth to the planned height before periods when wind erosion or crop damage is expected to occur.

Wind-borne sediment accumulated in trap strips shall be removed and distributed over the surface of the field as determined appropriate.

Trap strips shall be re-established or relocated as needed to maintain plant density and height.

When barriers are designed to enhance wildlife habitat, they shall not be mowed or pruned unless their height and width exceeds that required to obtain the wildlife objective and they become competitive with the adjoining land use. When mowing or pruning is necessary, it shall be done only during non-nesting season.

REFERENCE

National Agronomy Manual, 190-V-NAM, Third Edition, June 2002, Part 502, Wind Erosion.

NRCS, OK

May 2005

TABLE 1 [1/]

ESTIMATED TOLERANCE OF CROPS TO WIND AND/OR BLOWING SOIL

Tolerant (5 tons/ac/yr)*	Moderate Tolerance (2 tons/ac/yr)	Low Tolerance (1 ton/ac/yr)	Very Low Tolerance (0.5 ton/ac/yr)
Barley	Alfalfa (Est.)	Broccoli	Alfalfa seedlings
Buckwheat	Corn	Cabbage	Asparagus
Flax	Onions (>30days)	Cotton	Cantaloupe
Grain Sorghum	Soybeans	Cucumbers	Carrots
Millet	Sunflowers	Garlic	Celery
Oats	Sweet Corn	Green Beans	Eggplant
Rye		Lima Beans	Flowers
Wheat		Peas	Lettuce
		Peanuts	Muskmelons
		Potatoes	Onion seedlings
		Sweet Potatoes	Peppers
			Spinach
			Squash
			Strawberries
			Beets
			Tomatoes
			Watermelons

[1/] Data in Table 1 extracted from Table 502-4 (pg. 502-19) National Agronomy Manual.

*Crops will tolerate wind erosion equal to or greater than 5 tons/ac/yr soil loss.

The crops listed above are generally in the seedling to very young growth stage unless otherwise stated.

Crop tolerance values are expressed as tons/ac/yr. The system should be designed to prevent soil loss from exceeding the crop tolerance level the year the crop is grown. Values are estimates.

NRCS, OK

May 2005